

ASOS MODIFICATION NOTE 67 (for Electronics Technicians)

Engineering Division

W/OSO321: WDW

SUBJECT : Installation of a Universal Power Supply (UPS) into a Single Cabinet Automated Surface Observing System (ASOS)(SCA) (62828-40300-10)

PURPOSE : To provide a back-up AC power source.

EQUIPMENT AFFECTED : The UPS will be tied electrically between the incoming facility AC power and the power distribution assembly (PDA) to the SCA.

PARTS REQUIRED : Field Modification Kit (FMK): S100-FMK089

MOD PROCUREMENT : Washington Central Support will issue one UPS to each Class I SCA that does not have a UPS installed.

TOOLS REQUIRED : #1 Flat blade screwdriver
#1 Phillips screwdriver
#2 Phillips screwdriver
1" Adjustable wrench
5/8" Socket wrench
Crimping tool (58078-3) with die (58080-1)
Pliers
Maintenance Note 46

TIME REQUIRED : 5 Hours

AFFECT ON OTHER INSTRUCTIONS : None

EFFECTIVITY : All ASOS sites with SCA systems.

CERTIFICATION STATEMENT : This modification is authorized by the following ECP **S01017**.

GENERAL

EHB-11
Issuance 00-03
03/14/00

This modification contains procedures to install the Deltec PowerRite Pro II UPS and UPS bypass circuitry into an SCA (P/N 62828-40300-10). The UPS provides back-up AC power to the SCA in the event of intermittent or total facility power loss. Back-up power is provided to the UPS by a 48-volt DC battery pack which the UPS monitors and maintains an optimal charge under normal operating conditions.

PROCEDURE

The following instructions outline the procedures for the installation of the UPS.

NOTE:

Ensure the solid-state time delay relay (SSTDTR) (K1) has been installed inside the SCA prior to performing this modification. If not, Modification Note 53 must be performed at this time.

BEFORE INSTALLATION OF THE UPS

1. Call the ASOS Operations and Monitoring Center (AOMC) at 1-800-242-8194, and provide notification on which ASOS the UPS will be installed.
2. Get approval of the responsible meteorologist-in-charge (MIC)/official-in-charge (OIC)/observer before starting installation. Installation of the UPS may be performed on any day of the month if restrictions in steps 3 and 4 are satisfied.
3. **Commissioned Sites Only:** Do not start installation during inclement weather, precipitation, instrument flight rule conditions, or if any of those conditions are expected within 3 hours. The responsible meteorologist-in-charge (MIC)/official in charge (OIC)/ observer will define these meteorological conditions.
4. Do not start UPS installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Allow 4 hours to complete the installation and restart ASOS.
5. Immediately before beginning work at the National Weather Service (NWS)-staffed sites, the MIC/OIC/observer will inform the air traffic control tower (ATCT) and other critical users the ASOS will be turned off for the DCP upgrade. At an unstaffed site, the electronics technicians will inform the ATCT using controller video displays and operator interface devices (OID) to log-off and shutdown the displays to avoid problems.
6. Do not begin installation until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal back-up observing procedures will be implemented.

7. At the OID, log on as TECH.
 - a. Key **MAINT - ACT - FMK** and enter MOD **67**.
 - b. Key **MAINT - ACT - FMK - START**.

INSTALLATION OF THE UPS IN A SCA

WARNING

Ensure the AC power is completely removed from the SCA. DEATH OR SEVERE INJURY may result if power is not completely removed from the DCP prior to starting work on this modification.

CAUTION

Power reset kit (62828-40446-10) must be installed in the SCA before the UPS bypass kit (62828-40444-10) can be installed. Firmware revision 2.60 or higher must be present in the ACU memory card for ASOS to monitor this change.

1. Open the SCA and turn OFF the primary module circuit breaker, 7A1A1A3CB21.
2. At the AC junction box, open the junction box and turn OFF the circuit breaker labeled SCA.
3. In the SCA, locate and remove the following wires that run from the PDA, 7A1A1A4, and the yellow output receptacle, W106P37:
 - a. Gray wire labeled P37-1 and A1A4-12A.
 - b. White wire labeled P37-2 and A1A4-17C.
4. In the SCA, locate the wire A1A13K1-4/P36-1, and remove this label and the spade connector. Relabel this wire with wire marker No. 1, A1A13XK3-2 (62828-40431-2).
5. Dismount the SSTDR din rail, 7A1A1A13, from the SCA.
6. Install the K3 relay onto the XK3 socket. Attach the wire retainer to the XK3 socket and over the K3 relay. Refer to figure 1.
7. Slide the digital input/output (I/O) module K2 and high power relay XK3 onto the din rail next to the SSTDR K1. Install the end clamps on each side of the UPS bypass assembly. Refer to figure 2.

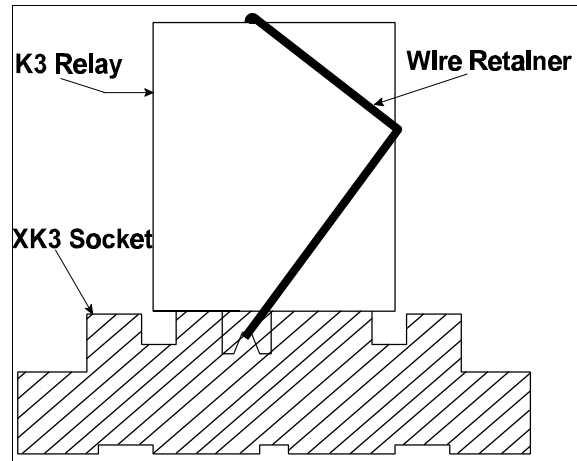


Figure 1 XK3 - Side View

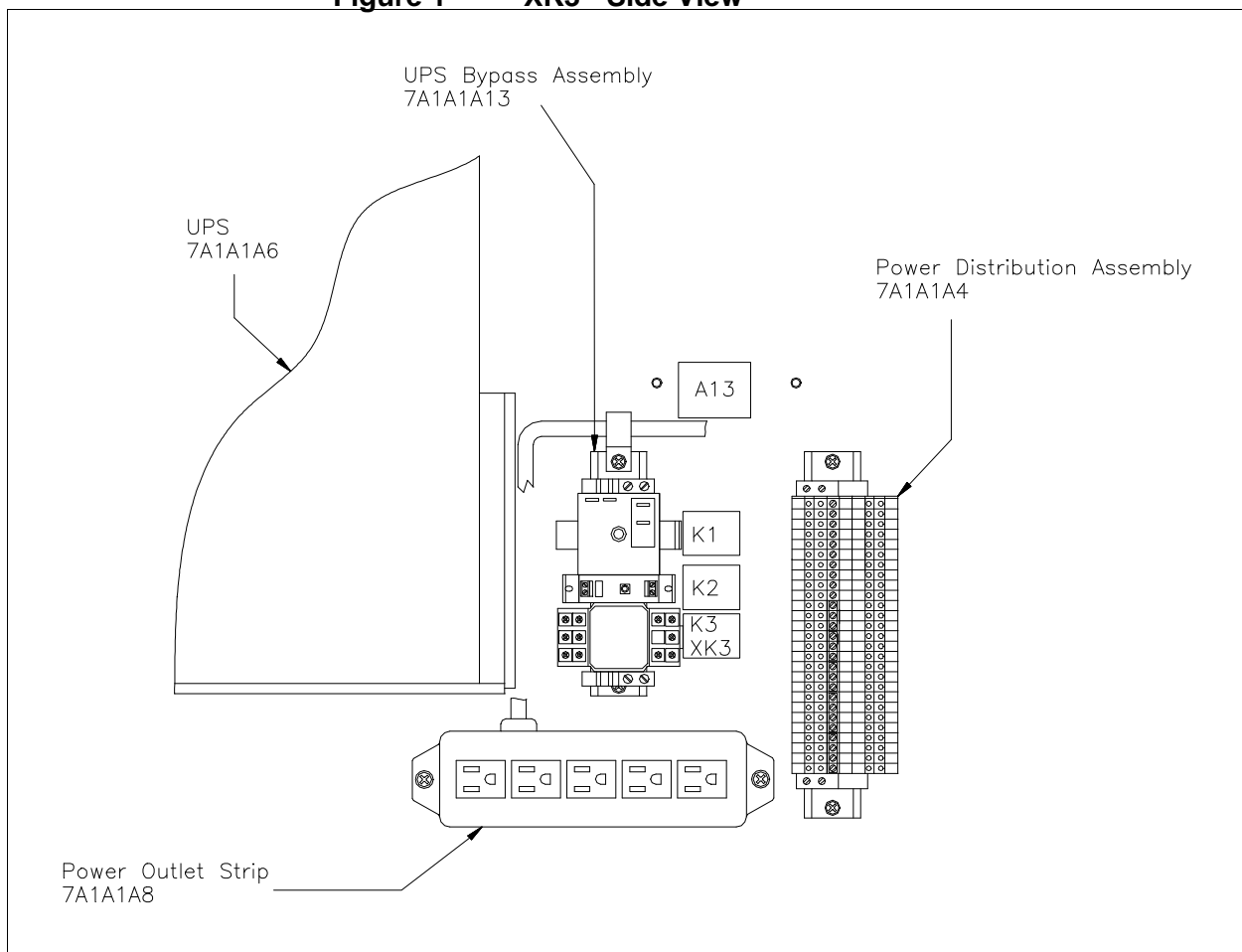


Figure 2 UPS Bypass Assembly Location

8. Perform the following wire connections listed in the following table:

FROM WIRE BUNDLE	WIRE LABEL	CONNECT TO
W133	A1A13K2-1/A1A13XK3-5	K2-1
	A1A13K2-2/A1A13XK3-A	K2-2
	A1A13XK3-5/P37-1 A1A13XK3-5/A1A13XK2-1	XK3-5
	A1A13XK3-6/P37-2 A1A13XK3-6/A1A13XK3-B	XK3-6
	A1A13XK3-1/A2XA15P2-B2	XK3-1
	A1A13XK3-2/A1A13K1-4 A1A13XK3-2 ¹	XK3-2
	A1A13XK3-3/A1A4-9C	XK3-3
	A1A13XK3-9/A1A4-17C	XK3-9
	A1A13XK3-8/A1A4-12A	XK3-8
	A1A13XK3-7/A2XA15P2-A7	XK3-7
	A1A13XK3-B/A1A13XK3-6	XK3-B
	A1A13XK3-A/A1A13K2-2	XK3-A
	A1A13K2-3/A2XA15P2-B1	K2-3
	A1A13K2-4/A2A15P2-A13	K2-4
	A1A13K1-4/A1A13XK3-2	K1-4

9. Reinstall the UPS bypass assembly din rail to the SCA backplate and install UPS bypass labels beside each module as shown in figure 2.
10. In the W133 wire harness, route the 4 thin, white wires to the back of the VME rack.

NOTE:

When making connections to the PDA, ensure the wires are not inserted too far into their terminals. If this occurs and the terminal screw is tightened down, the wire insulation may prevent electrical contact from taking place. Furthermore, check each connection by giving a slight tug on each wire.

¹ Wire from step 4.

11. Connect the following wires to the PDA:

FROM WIRE BUNDLE	WIRE LABEL	CONNECT TO
W133	A1A4-9C/A1A13XK3-5	A1A1A4-9C ²
	A1A4-17C/A1A13XK3-9	A1A1A4-17C
	A1A4-12A/A1A13XK3-8	A1A1A4-12A

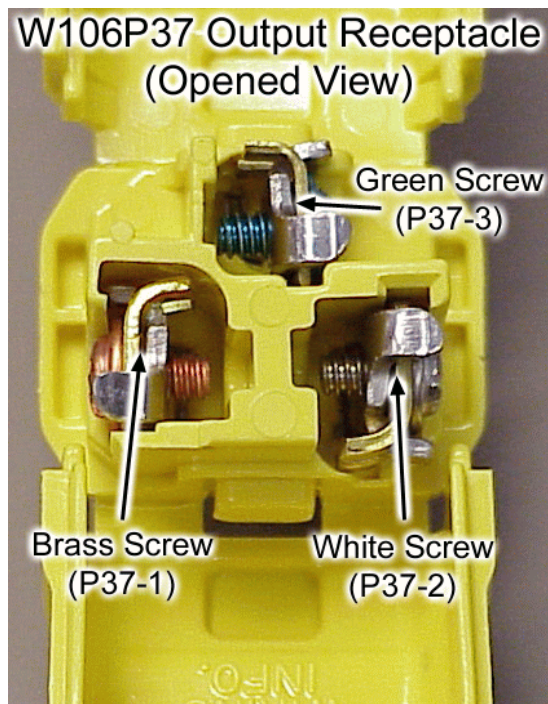


Figure 3 P37 Output Receptacle

12. Open the W106P37 output receptacle and add the following wires. Refer to figure 3.

WIRE LABEL	CONNECT TO
P37-1/A1A13XK3-5	W106P37-1
P37-2/A1A13XK3-6	W106P37-2

13. At the VME rack, remove the digital I/O board, 7A1A1A2XA15.

CAUTION

The harness attached to the VME rack will remain attached when removed from the SCA backplate. Care must be taken not to damage the wiring or terminations during the following steps.

14. Carefully remove the four nuts and associated washers that fasten the VME rack to the SCA backplate. Carefully lift the VME rack off of the backplate, gently roll the entire assembly forward to expose the rear panel, and rest it on top of the faraday box.

² There will now be two wires connected at A1A1A4-9C.

NOTE:

When inserting wires into the digital I/O connector terminal P2, orientate the wire connectors with the locking pin **down**. Be sure to listen for a “click” sound which will indicate the pin is seated properly inside the connector terminal.

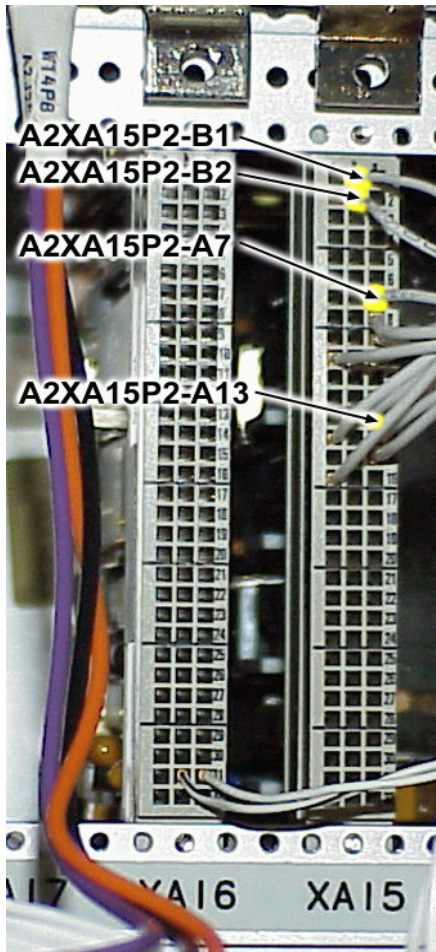


Figure 4 **7A1A1A2XA15P2**

15. Route the four 22-gauge white wires to the VME rack connector 7A1A1A2XA15P2 and insert them as illustrated in figure 4.
16. Spot tie any loose wires with cable ties. While the back of the VME rack is exposed, check the tightness of the grounding wires and lug terminal on the VME backplane.
17. Carefully reattach the VME rack to the SCA backplate, using the hardware removed in step 14.
18. Reinstall the digital I/O board into the VME rack.

CAUTION

The battery box (with batteries) is heavy. Take care to avoid injury due to improper lifting or accidental dropping of the battery assembly. Batteries can be damaged by a short circuit. Do not allow foreign material to enter the battery box connector.

19. Install the UPS kit into the SCA. Refer to figure 5.

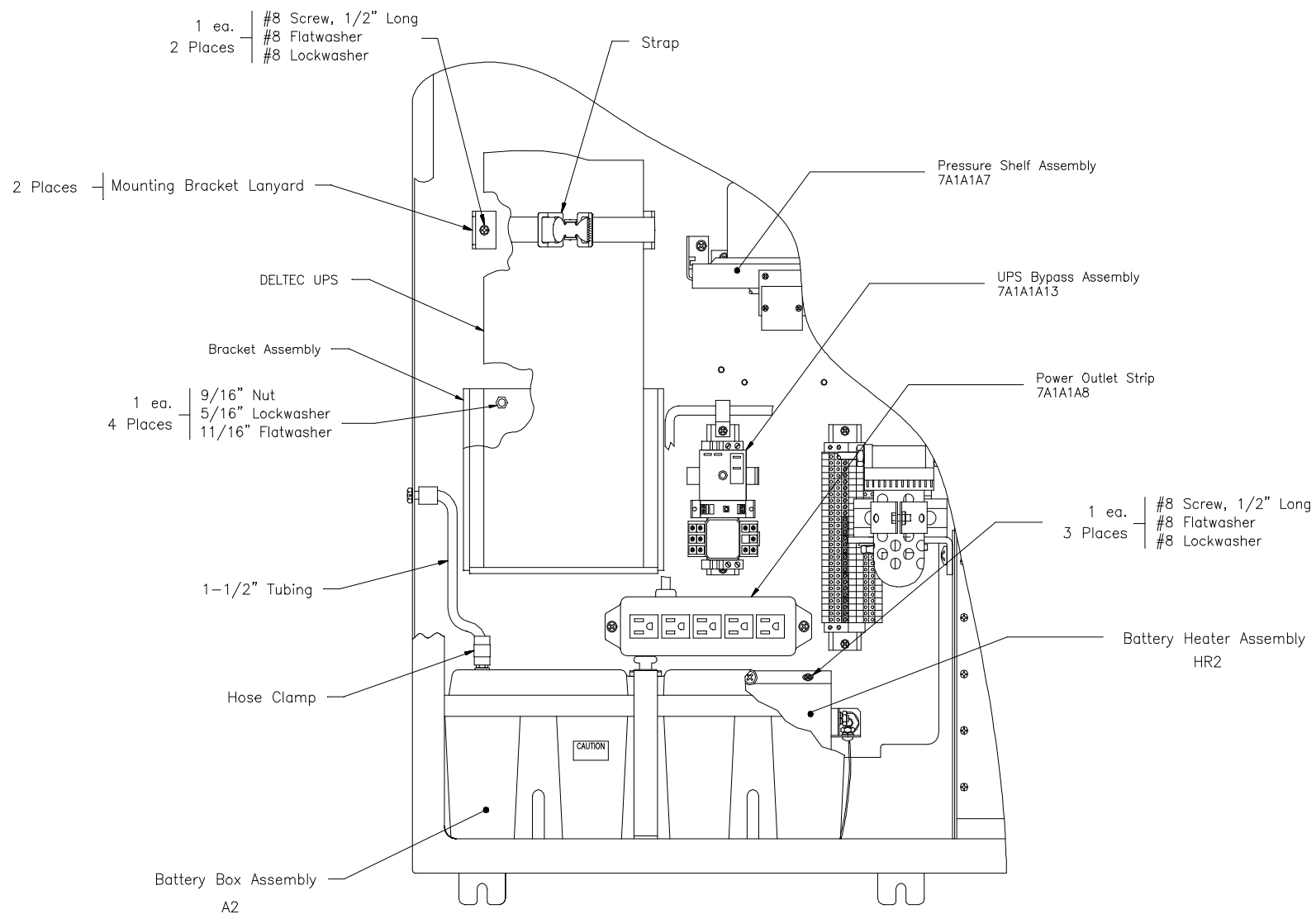


Figure 5 UPS Kit

20. Attach the following wires and connectors to the UPS kit.

Wire/Connector Label	Connect to
W15P44 (Battery Heater Cable)	A1HR2P1
W106P37	UPS OUTPUT
W106P36	UPS INPUT
W15P22 (RS232 SIO Cable)	W78P1
W78P2 (DB9 Connector on W78)	UPS COMM PORT
A2P1 (Battery Box Connector)	UPS BATTERY PORT

SYSTEM CHECK OUT

1. At the AC junction box, switch the circuit breaker labeled for the SCA to ON.
2. In the SCA, set the circuit breaker 7A1A1A3CB21 to ON. On the front power panel of the UPS, switch the power switch to ON.
3. Before returning to the OID perform the following:
 - a. Verify the red light emitting diode (LED) on A1A9K2 is illuminated.
 - b. Using a voltmeter, verify that 115 VAC \pm 10% are present across pins A1A1A13XK3-A and A1A1A13XK3-B.
4. Return to the OID and configure the UPS as outlined in Maintenance Note 46.
5. With the UPS configured, perform the following checks:
 - a. Key the following functions:
MAINT - SEL ACU - ACU UPS
Verify the UPS bypass status and command fields read:

<	UPS INLINE:	P
<	CMD UPS INLINE	ON
 - b. Key **BYPAS**
After approximately 2 minutes, verify the UPS bypass status, command, and fail count fields read:

<	UPS INLINE	F	1
<	CMD UPS INLINE	OFF	

c. Return to the SCA and verify the red LED on A1A9K2 is *NOT* illuminated. Using a voltmeter, verify *less than* 10 VAC are present across pins A1A1A13XK3-A and A1A1A13XK3-B.

d. Key **BYPAS**

After approximately 2 minutes, verify the UPS Bypass status, command, and fail count fields read:

<	UPS INLINE	P	1
<	CMD UPS INLINE	ON	

6. Return to the SCA and toggle the power switch on the rear panel of the UPS to OFF. The SCA should go to bypass mode and continue operating without a glitch. Wait approximately 2 minutes, then restore power to the UPS once again.

7. Return to the OID and verify the UPS bypass status, command, and fail count fields read:

<	UPS INLINE	P	2
<	CMD UPS INLINE	ON	

Review the SYSLOG and verify that error messages “SCA UPS OUTPUT DISABLED” and “SCA UPS BY-PASSED” were issued.

8. Check the 12-HR sensor pages to ensure data is being collected from the sensors. Clear all failures on the MAINT page that were caused by powering the system down and proceed to: **AFTER UPS INSTALLATION**

AFTER UPS INSTALLATION

1. Contact the AOMC at 1-800-242-8194 and inform the operator of:

- a. Your location.
- b. The installation of the UPS kit and UPS bypass relay have been completed.

2. Enter in the SYSLOG that maintenance has been completed. Key the following functions: **MAINT - ACT - FMK**.

For the FMK number, enter: **MOD 67**. On the second line of the screen, verify only MOD 67 is displayed. Complete by entering **Y** in the [Y/N] area if only MOD 67 is displayed.

3. Check the SYSLOG, and verify the FMK message. Enter a comment in the SYSLOG stating the UPS has been installed.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report the completed modification on a WS Form A-26, Maintenance Record, using the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, appendix A. Record the following items.

See attachment **C** for a completed sample of WS Form A-26, Maintenance Record.

- ! **ASCA** in block 7
- ! **S100-1A4A1-2** in block 13a
- ! **6130-01-411-5252** in block 13b
- ! **E** in block 13c
- ! **A** in block 13d
- ! **999** in block 13e
- ! **1** in block 13f
- ! Number of hours spent installing the UPS in block 13g
- ! **67** in block 17a
- ! **62828-90338-20** in block 18, vendor part number (new part)
- ! **N/A** in block 18, serial number (old part)
- ! The serial number of the new UPS in block 18, serial number (new part)

Original Signed

John McNulty
Chief, Engineering Division

Appendix A - Site Table
Appendix B - Parts List
Appendix C - A-26 Form

Class I ASOS Sites to Install a UPS into the SCA		
Site ID	City, State	Region
CDJ	Chillicothe, MO	Central
DO7	Faith, SD	Central
GNA	Grand Marais, MN	Central
LXV	Leadville, CO	Central
P28	Medicine Lodge, KS	Central
P59	Copper Harbor, MI	Central
P60	Yellowstone Lake, WY	Central
P75	Manistique, MI	Central
SPD	Springfield, CO	Central
6R6	Dryden, TX	Southern
CQC	Clines Corner, NM	Southern

SCA UPS By-pass Kit (62828-40444-10)		
Part Number	Quantity	Nomenclature
62828-40431-2	1	Marker No. 1 (A1A13XK3-2)
62828-40431-3	1	Marker No. 2 (A1A13XK3-3)
62828-40439-4	1	Label, "K2"
62828-40439-5	1	Label, "K3 XK3"
62828-42104-10	1	SCA UPS By-pass Wire Harness (W133)
62828-90132-1	2	Spade Lug
62828-90428-1	1	High Power Relay (K3)
62828-90429-1	1	Digital I/O Module (K2)
62828-90430-1	1	High Power Relay Socket (XK3)
62828-90438-1	1	Wire Retainer, Relay
MS3367-4-9	12	Cable Ties
UPS Kit (62828-40368-10)		
62828-40266-10	1	Bracket Assembly
62828-90338-20	1	DELTEC UPS
62828-90341-3	1	Strap
62828-40263-1	2	Mounting Bracket Lanyard
62828-40223-10	1	Battery Heater Assembly
62828-40262-10	1	Battery Box Assembly
62828-90168-1	2	Hose Clamp
62828-90185-1	1	1-1/2' Tubing
MS51957-45	5	No. 8 Screw, 1/2" Long
MS15795-807	5	3/16" ID x 3/8" OD Flatwasher
MS35338-137	5	No. 8 Lockwasher
MS35649-2314	4	9/16" Nut
MS35338-140	4	5/16" Lockwasher
MS15795-812	4	11/32" ID x 11/16" OD Flatwasher

EMRS A-26 Form